

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Tatsuya IGARASHI et al.

Application No.: 10/530,289

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Art Unit: 1794

For: ORGANIC ELECTROLUMINESCENT
DEVICE

Examiner: D. L. Garrett

DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Madam:

I, Toshihiro Ise, declare and say as follows:

I am named as a co-inventor of the above-identified application.

I have carried out additional comparative testing myself or under my supervision. Test procedures and results are shown below.

Additional Comparative Testing

Additional Comparative Examples 55-108 were prepared under the same concentration conditions as Example 8. The results of Additional Comparative Examples 55-108 are shown in the attached Table. Additional Comparative Examples 1-54 are the same as the examples provided with the Rule 132 Declaration filed on August 11, 2008. These examples are repeated in the attached Table for convenience. Some combinations of host materials disclosed in U.S. Patent Application Publication No. 2002/0125818 to Sato et al. (hereinafter, "Sato '818") are not effective to show the many examples where no luminescence was available. These results are shown as "No light emission."

The present invention uses carbazole compound (A-10) and arylamine compound (C-10) as a hole transporting host; imidazole compounds (ET-1, ET-2), triazine compound (A-28), aromatic hydrocarbon compounds (C-18 and C-22), and aluminum complex compound (B-68) as an electron transporting host; and homoleptic iridium complex (G-1) and heteroleptic iridium complex (G-2) as a phosphorescent material. Thus, many compounds are shown to be effective without limitation for the structure. As further support, inventive Additional Examples 3-26 were conducted to provide examples where the luminescent material, hole transporting layer material, electron transporting layer material, and cathode are changed and where the combination and concentration of the hosts are changed. These results are also shown in the attached Table.

As is apparent from the results shown in the attached Table, the devices of the Additional Comparative Examples provide bad performance in operation durability and external quantum efficiency.

The data already of record in the specification and the supplemental data submitted herewith demonstrate superior results of the claimed organic electroluminescent device over those of the cited references:

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S. Code 1001 and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

By: Toshihiro Ise
Dr. Toshihiro Ise

Date: Jun. 9, 2009

[illegible]

[illegible]

Example#		External quantum efficiency	Operation durability (@500cd/m ²)	
Additional Example 3	ITO/CdTe (10)/NPD (50)/85 9%NiC-18 53%ET-21.5 60% (pp2) 150/ET-2150/L/FAI	8.09%	2100h	UV photoconductive material disclosed in WO2002/015445 (cited on page 31 of the present spec).
Additional Example 4	ITO/CdTe (10)/NPD (50)/85 9%NiC-18 53%ET-21.5 60% (pp2) 150/ET-2150/L/FAI	8.09%	2100h	UV photoconductive material disclosed in WO2002/015445 (cited on page 31 of the present spec).
Additional Example 5	ITO/CdTe (10)/NPD (50)/85 9%NiC-18 53%ET-21.5 60% (pp2) 150/L/FAI	6.59%	2000h	It is used for electron emitting layer.
Additional Example 6	ITO/CdTe (10)/NPD (50)/85 9%NiC-18 53%ET-21.5 60% (pp2) 150/ET-2150/Mg : Ag	7.09%	2000h	Cathode is changed to Mg:Ag
Additional Example 7	ITO/CdTe (10)/NPD (50)/85 9%NiC-17+8 53%ET-11.5 60% (pp2) 150/ET-2150/L/FAI	6.99%	1800h	Combination of hosts is changed
Additional Example 8	ITO/CdTe (10)/NPD (50)/85 9%NiC-12+8 53%ET-20.5 60% (pp2) 150/ET-2150/L/FAI	7.39%	1900h	Combination of hosts is changed
Additional Example 9	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+4 53%ET-18 60% (pp2) 150/ET-2150/L/FAI	9.39%	1900h	Combination of hosts is changed
Additional Example 10	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+4 53%ET-18 60% (pp2) 150/ET-2150/L/FAI	9.39%	1900h	Combination of hosts is changed
Additional Example 11	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+8 53%ET-18 60% (pp2) 150/ET-2150/L/FAI	8%	2500h	Combination of hosts is changed
Additional Example 12	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+8 53%ET-18 60% (pp2) 150/ET-2150/L/FAI	6.99%	2400h	Combination of hosts is changed
Additional Example 13	ITO/CdTe (10)/NPD (50)/85 9%NiC-12+8 53%ET-20.5 60% (pp2) 150/ET-2150/L/FAI	7%	2300h	Combination of hosts is changed
Additional Example 14	ITO/CdTe (10)/NPD (50)/85 9%NiC-12+8 53%ET-20.5 60% (pp2) 150/ET-2150/L/FAI	7.69%	2000h	Combination of hosts is changed
Additional Example 15	ITO/CdTe (10)/NPD (50)/85 9%NiC-12+8 53%ET-20.5 60% (pp2) 150/ET-2150/L/FAI	7.49%	2000h	Combination of hosts is changed
Additional Example 16	ITO/CdTe (10)/NPD (50)/85 9%NiC-17+4 53%ET-11 60% (pp2) 150/ET-2150/L/FAI	7.49%	3000h	Combination of hosts is changed
Additional Example 17	ITO/CdTe (10)/NPD (50)/85 9%NiC-17+4 53%ET-11 60% (pp2) 150/ET-2150/L/FAI	6.59%	1700h	Combination of hosts is changed and concentration is changed
Additional Example 18	ITO/CdTe (10)/NPD (50)/85 9%NiC-12+4 53%ET-20.5 60% (pp2) 150/ET-2150/L/FAI	7.09%	1800h	Combination of hosts is changed and concentration is changed
Additional Example 19	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+4 53%ET-18 60% (pp2) 150/ET-2150/L/FAI	6.79%	2100h	Combination of hosts is changed and concentration is changed
Additional Example 20	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+4 53%ET-18 60% (pp2) 150/ET-2150/L/FAI	7.39%	2100h	Combination of hosts is changed and concentration is changed
Additional Example 21	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+4 53%ET-18 60% (pp2) 150/ET-2150/L/FAI	5.99%	2400h	Combination of hosts is changed and concentration is changed
Additional Example 22	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+4 53%ET-20.5 60% (pp2) 150/ET-2150/L/FAI	5.99%	2000h	Combination of hosts is changed and concentration is changed
Additional Example 23	ITO/CdTe (10)/NPD (50)/85 9%NiC-12+4 53%ET-20.5 60% (pp2) 150/ET-2150/L/FAI	6.39%	2100h	Combination of hosts is changed and concentration is changed
Additional Example 24	ITO/CdTe (10)/NPD (50)/85 9%NiC-12+4 53%ET-20.5 60% (pp2) 150/ET-2150/L/FAI	6.39%	1950h	Combination of hosts is changed and concentration is changed
Additional Example 25	ITO/CdTe (10)/NPD (50)/85 9%NiC-10+4 53%ET-18 60% (pp2) 150/ET-2150/L/FAI	6.79%	1900h	Combination of hosts is changed and concentration is changed